ADDITIONAL

Service Manual

PIONEER®
The future of sound and vision.

ORDER NO.
ARP1562

GRAPHIC EQUALIZER

GR-333 WEZ, WB, SD

GR-333-S WEZ

• Refer to the service manual ARP1151, GR-470 (BK).

- This manual is applicable to the WEZ, WB, SD and GR-333-S/WEZ types.
- The GR-333 is the same as the GR-470 (BK) except for color.
- The GR-333-S is silver versions of the GR-333.

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CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

The GR-333/WEZ, WB and SD types are the same as the GR-470 (BK)/KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.					Remarks
		GR-470(BK)/ KU type	GR-333/ WEZ type	GR-333/ WB type	GR-333/ SD type	GR-333-S/ WEZ type	
	Push knob (EQUALIZER, TAPE MPNITOR)	AAY-398	AAD1422	AAD1422	AAD1422	AAD1200	
	Slide knob (EQUALIZER, CONTROLS)	AAY-135	AAD1424	AAD1424	AAD1424	AAD1424	
	Power knob (POWER)	AAY-405	AAD1426	AAD1426	AAD1426	AAD1427	
⚠	AC Power cord	ADG-088	ADG1022	ADG-096	ADG1015	ADG1022	
⚠★★	FU2 Fuse (0.5A)	AEK-136	AEK-504	AEK-504	.....	AEK-504	
⚠★★	FU2 Fuse (T2.5A)	.....	AEK-512	AEK-512	.....	AEK-512	
⚠	AC socket (AC OUTLET)	AKP-507	AKP-508	AKP-509	.....	AEP-508	
	Front panel	ANB1009	ANB1221	ANB1221	ANB1221	ANB1222	
	Packing case	AHD1134	AHD1476	AHD1476	AHD1476	AHD1477	
	Operating instractions (English)	ARB1012	.....	ARB1122	ARB1122	.....	
	Operating instractions (English/German/French/Italian)	.....	ARE1089	.....	.....	ARE1089	
	Sub instractions	.....	.....	.....	ARH1052	.....	
⚠★★	Line voltage selector	.....	.....	.....	AKX1007	.....	
	Screw	.....	.....	.....	VTZ30P100FZK	.....	For voltage selector
	Panel base	AMB1020	AMB1020	AMB1020	AMB1020	AMB1070	
	Bonnet case	ANE1008	ANE1008	ANE1008	ANE1008	ANE1020	

PIONEER®

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS

ORDER NO.
ARP 1151-0

GRAPHIC EQUALIZER

GR-470(BK)
GR-470

MODEL GR-470 (BK) AND GR-470 COMES IN SIX VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Applicable model		Power requirement	Destination
	GR-470 [BK]	GR-470		
KU	○	–	AC120V only	U.S.A.
S	○	–	AC110V, 120V, 220V, 240V (switchable)	General market
WP	○	–	AC220V–240V	Australia
WB	○	○	AC220V–240V	United Kingdom
WEZ	○	○	AC220V–240V	European Continent and West Germany
KC	○	–	AC120V only	Canada

- This service manual is applicable to the KU, WEZ, WB, WP and S types.
- As to the WEZ, WB, WP and S types, please refer to page 15.
- As to the KC type, please refer to the additional service manual (ARP1152).

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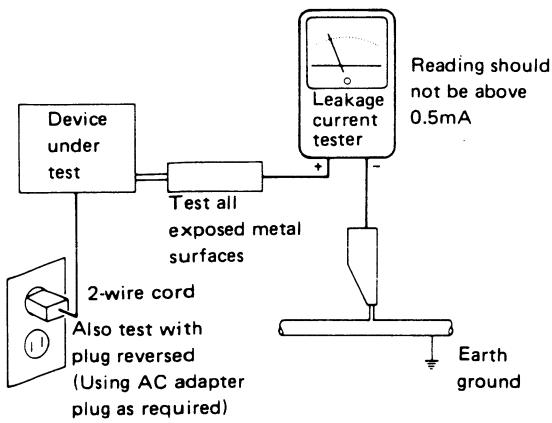
SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Reading should not be above 0.5mA
Leakage current tester
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

1. SPECIFICATIONS

Input terminals (reference input level/input impedance)
INPUT, TAPE PLAY ..... 150 mV/50 kΩ
Gain ..... 0 dB
Output terminals
(reference output level/output impedance)
OUTPUT ..... 150 mV/3.3 kΩ
REC OUT ..... 150 mV
Harmonic distortion (20 Hz ~ 20 kHz, output 1V)
..... 0.03%
Frequency response
INPUT, TAPE PLAY ..... 5 Hz ~ 50 kHz $^{+0}_{-3}$ dB
Equalizer bands
Center frequencies
..... 60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.4 kHz, 6 kHz, 15 kHz
Variable range ..... ±10 dB
SN ratio (IHF, A network, short circuit, I V)
INPUT, TAPE PLAY ..... 106 dB
SN ratio (DIN)
INPUT, TAPE PLAY ..... 93 dB

Electrical section, miscellaneous

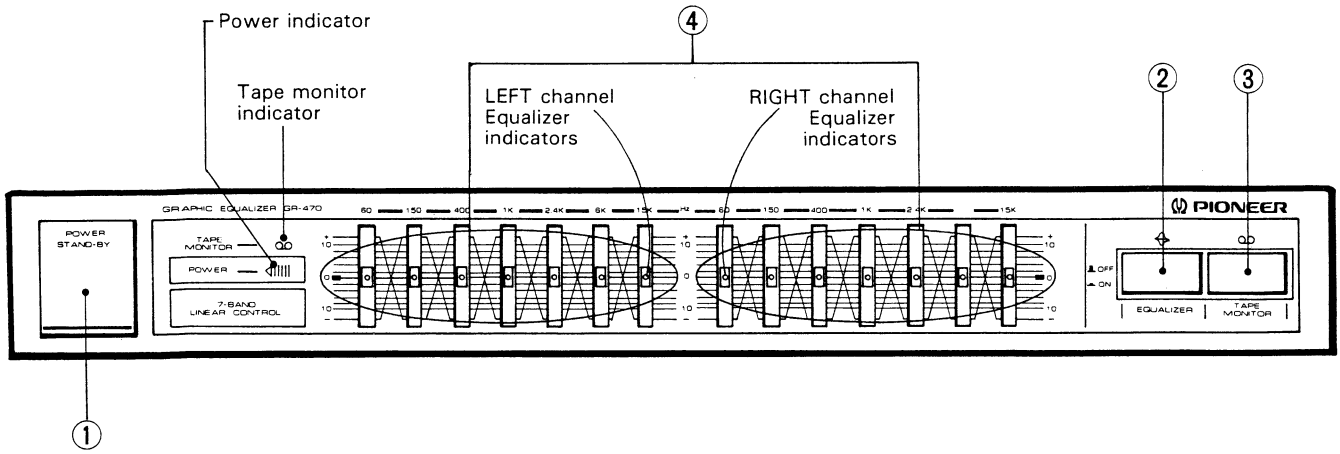
Power requirements
European, U.K., Australian models
..... a.c 220—240 volts~ 50/60 Hz
U.S., Canadian models ..... AC 120 V, 60 Hz
Other destination models.....~ AC 110 V/120V /220 V/240 V (switchable), 50/60 Hz
Power consumption 6W
External dimensions (W × H × D)
.....420×60×221 mm
16-9/16 × 2-3/8 × 8-11/16 in
Weight .....2.2 kg (4 lb 14 oz)

Accessories

Pin-plug cords 2
Operating Instructions 1

Specifications and design subject to possible change without notice due to improvements.

2. FRONT PANEL FACILITIES



① POWER SWITCH (POWER STAND-BY/ON)

When this switch is set to the ON position, power is supplied to the unit's main circuits (Power indicator lights). The unit's power switch is geared to selecting the transformer's secondary and so even at the STAND-BY position, the unit's circuitry will work as long as the power cord is connected to the power outlet.

Disconnect the power cord from the power outlet when you do not plan to use the unit for a long period of time.

NOTE:
Even when performing playback without using the functions of this component, be sure that its power switch is ON. If the power switch is OFF, no sound will be produced from the speakers.

② EQUALIZER SWITCH (EQUALIZER)

When this switch is pressed, the equalizer indicators light and its functions become operative. When pressed once again, these indicators go out and the unit's functions are turned OFF. Use this switch in the following manner:

ON: When using the equalizer to add sound compensation while performing mixing operations with program sources (FM broadcasts, records, tape playback, etc.), and playing back and/or recording the results.

OFF: When not using the equalizer, but playing back or recording program sources without compensation.

In this case, the equalizer cannot be used, but tape monitor selection can be performed (when tape monitor indicator is ON, tape playback, and when OFF, source playback).

③ TAPE MONITOR SWITCH

When this switch is pressed, the tape monitor indicator lights. When pressed again, the indicator goes out. Use this switch in the following manner:

ON: When using the tape deck connected to the equalizer's tape terminals to play back tapes with or without adding sound compensation.

OFF: When using the components (tuner, turntable, tape deck) connected to the stereo amplifier to play back music with or without adding sound compensations.

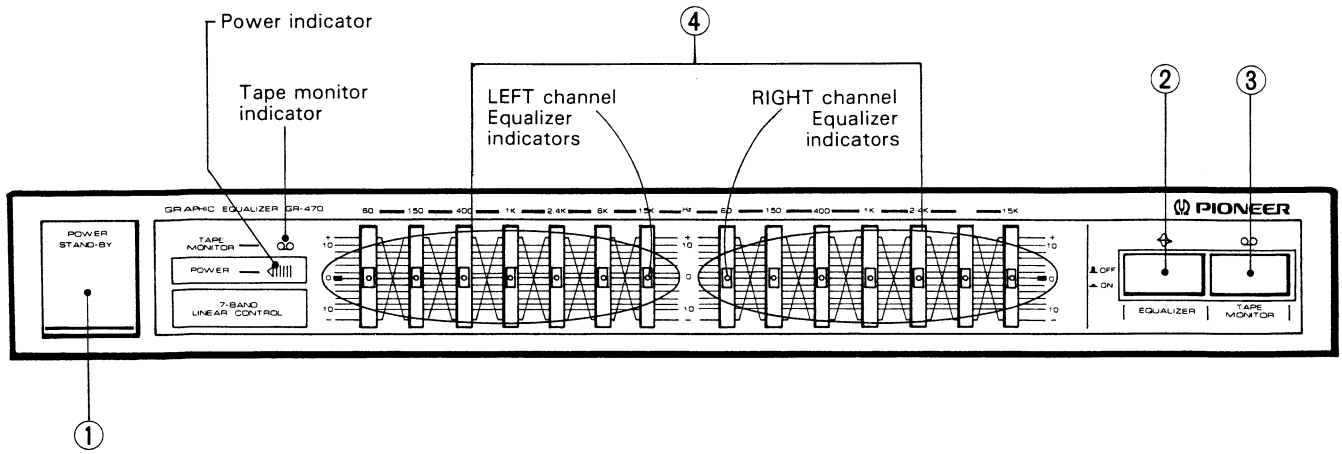
④ EQUALIZER CONTROLS

These are equalizer controls for the bands 60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.4 kHz, 6 kHz and 15 kHz.

When the equalizer switch has been set to ON, these controls may be adjusted. When a control is raised upwards from the "0" position, the frequency band corresponding to that control will be emphasized; when the control is lowered, the frequency band will be attenuated. These controls can be used independently for right and left channels.

NOTE:
In order to protect your speakers from damage resulting from excessively large inputs, whenever augmenting high-frequency sounds over a wide range, be sure not to raise your amplifier's sound volume too high.

2. FRONT PANEL FACILITIES



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Disconnect the power cord from the power outlet when you do not plan to use the unit for a long period of time.

NOTE:
Even when performing playback without using the functions of this component, be sure that its power switch is ON. If the power switch is OFF, no sound will be produced from the speakers.

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OFF: When using the components (tuner, turntable, tape deck) connected to the stereo amplifier to play back music with or without adding sound compensations.

④ EQUALIZER CONTROLS

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When the equalizer switch has been set to ON, these controls may be adjusted. When a control is raised upwards from the "0" position, the frequency band corresponding to that control will be emphasized; when the control is lowered, the frequency band will be attenuated. These controls can be used independently for right and left channels.

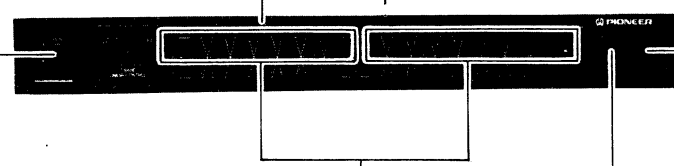
NOTE:
In order to protect your speakers from damage resulting from excessively large inputs, whenever augmenting high-frequency sounds over a wide range, be sure not to raise your amplifier's sound volume too high.

3. PARTS LOCATION

NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Front Panel View



Front panel
ANB1009

Bonnet case
ANE1008

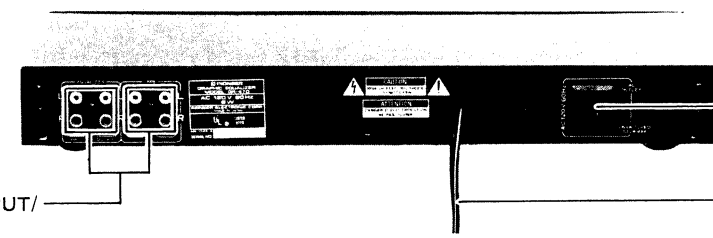
Power knob (POWER)
AAY-405

Push knob (TAPE MONITOR)
AAY-398

Slide knob (EQUALIZER CONTROLS)
AAY-135

Push knob (EQUALIZER)
AAY-398

Rear Panel View

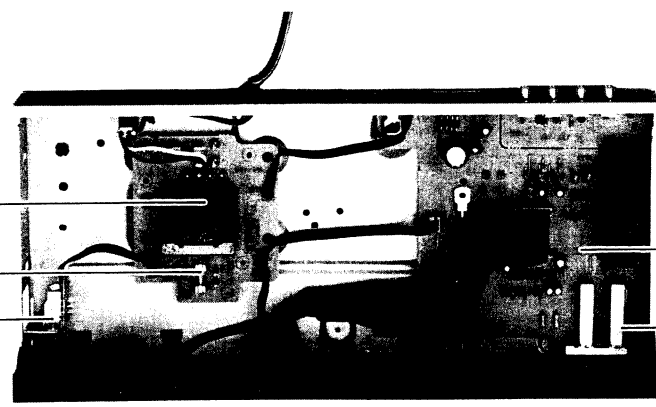


⚠ AC socket (AC OUTLET)
AKP-507

Terminal 4P (EQUALIZER INPUT/ OUTPUT, TAPE)
AKB-094

⚠ AC power cord
ADG-088

Top View with Bonnet Case Removed



Transformer assembly

⚠ ★★ Fuse (0.5A: FU2)
AEK-136

Switch assembly

Complex assembly
GWK-270

★★ Push switch (TAPE MONITOR, EQUALIZER)
SUL8M66SC

4. EXPLODED VIEWS AND PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
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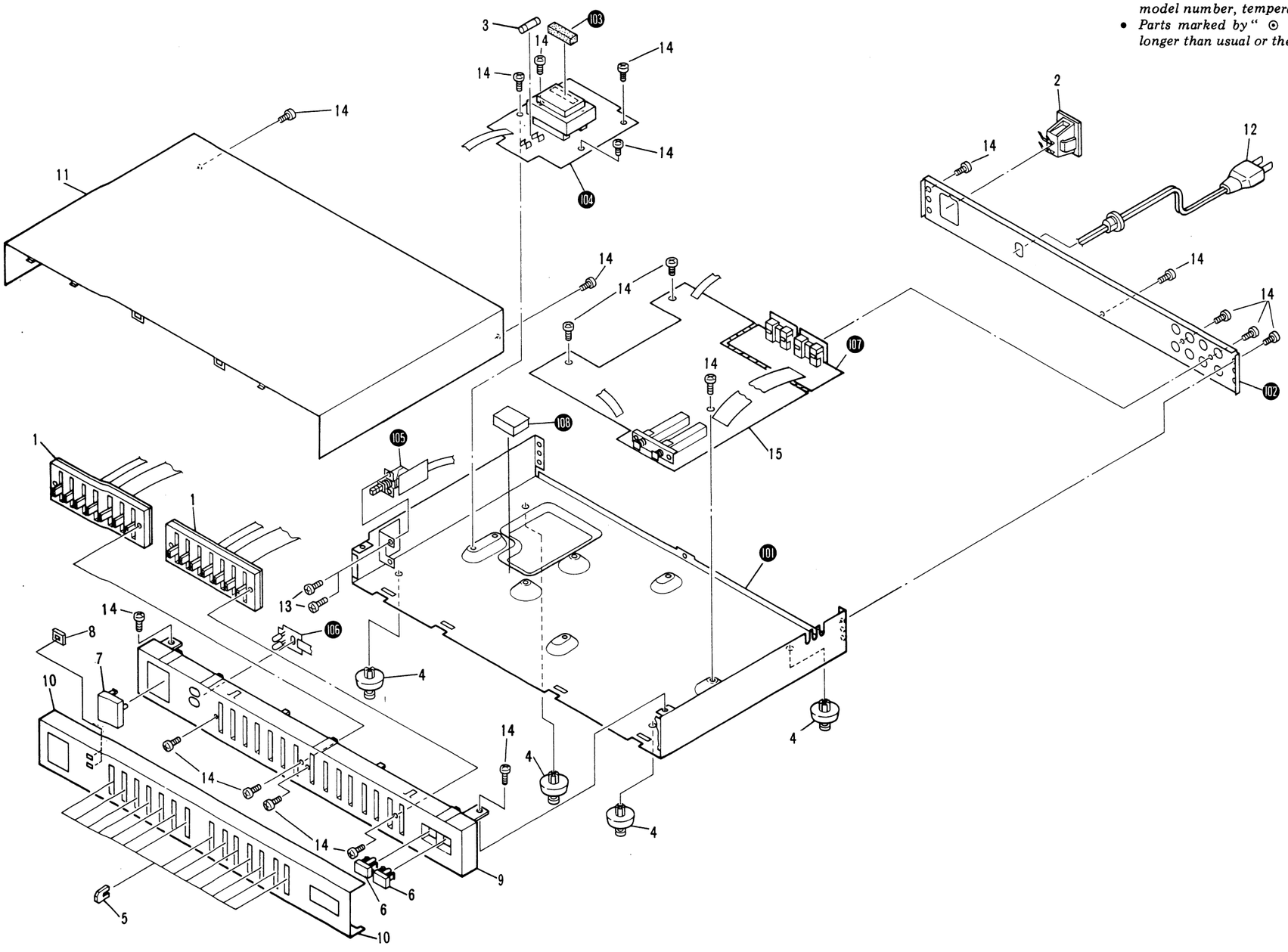


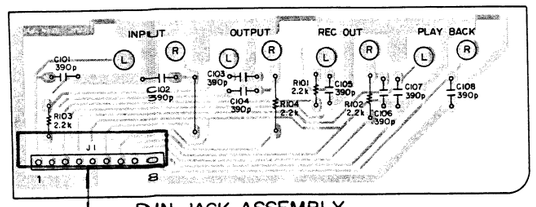
Parts List

Mark	No.	Part No.	Description
	1	ACX-318	7 Band variable resistor
⚠	2	AKP-507	AC Socket (AC OUTLET)
⚠ ★★	3	AEK-136	Fuse (0.5A: FU2)
	4	AEC-784	Leg assembly
	5	AAY-135	Slide knob (EQUALIZER CONTROLS)
	6	AAY-398	Push knob (EQUALIZER, TAPE MONITOR)
	7	AAY-405	Power knob (POWER)
	8	AEC-395	Indicator lens
	9	AMB1020	Panel base
	10	ANB1009	Front panel
	11	ANE1008	Bonnet case
⚠	12	ADG-088	AC power cord
	13	VMZ30P060FMC	Screw
	14	BBZ30P080FZK	Screw
	15	GWK-270	Complex assembly
	101		Chassis
	102		Rear panel
	103		Cushion rubber D
	104		Transformer assembly
	105		Switch assembly
	106		LED assembly
	107		Pin jack assembly
	108		Cushion rubber

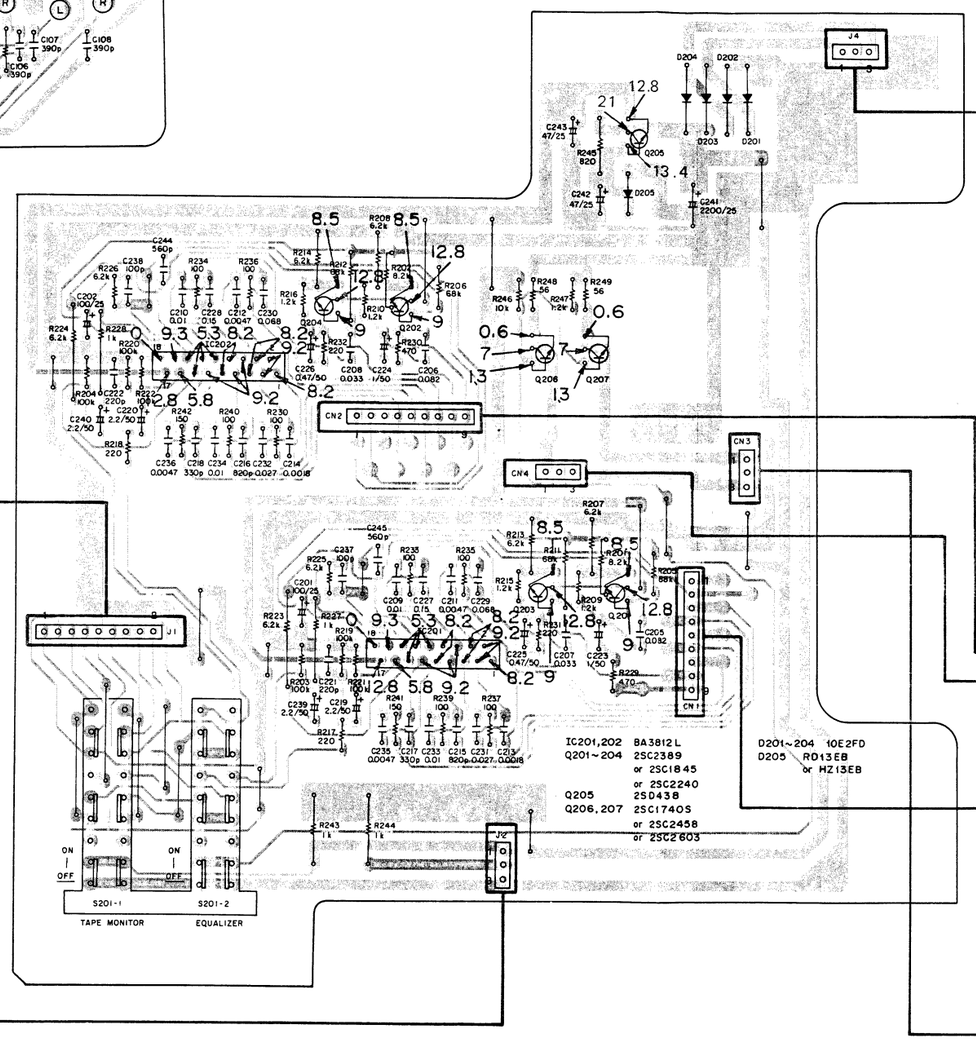
5. P.C.BOARDS CONNECTION DIAGRAM (For KU Type)

COMPLEX ASSEMBLY GWK-270

IC202 Q204 Q202 IC201 Q203 Q206 Q207 Q201 Q205



PIN JACK ASSEMBLY



TRANSFORMER ASSEMBLY

SWITCH ASSEMBLY

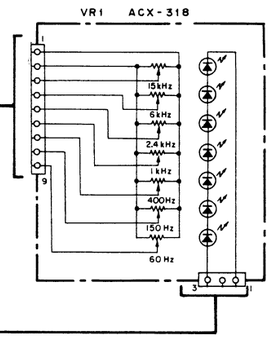
AC OUTLET
UNSWITCHED
100W MAX
AKP-507

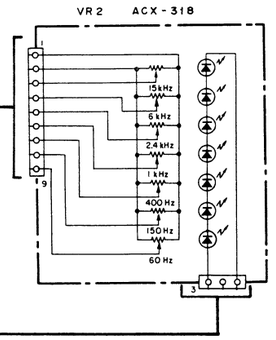
AC 120V
60Hz

AC POWER CORD
ADG-088

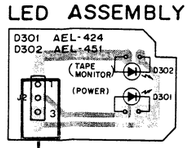
IC201,202 BA3812L
Q201~204 2SC2389
or 2SC1845
or 2SC2240
Q205 2SD438
Q206,207 2SC1740S
or 2SC2458
or 2SC2603

D201~204 10E2FD
D205 RD13EB
or HZ13EB



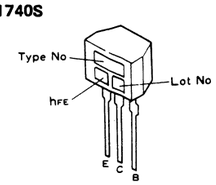


LED ASSEMBLY

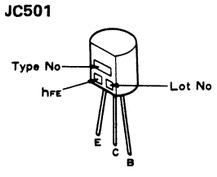


External Appearance of Transistors and ICs

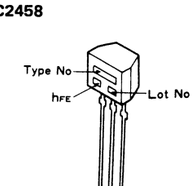
2SC1740S



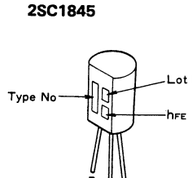
JC501



2SC2458



2SC1845



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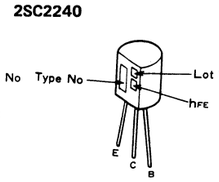
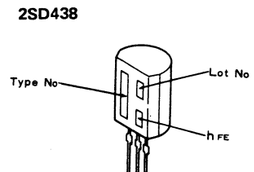


2SD438



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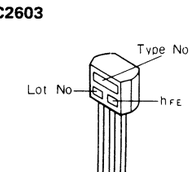
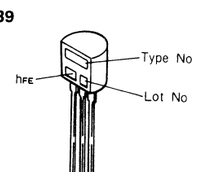
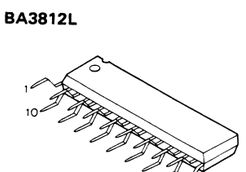


2SC2389

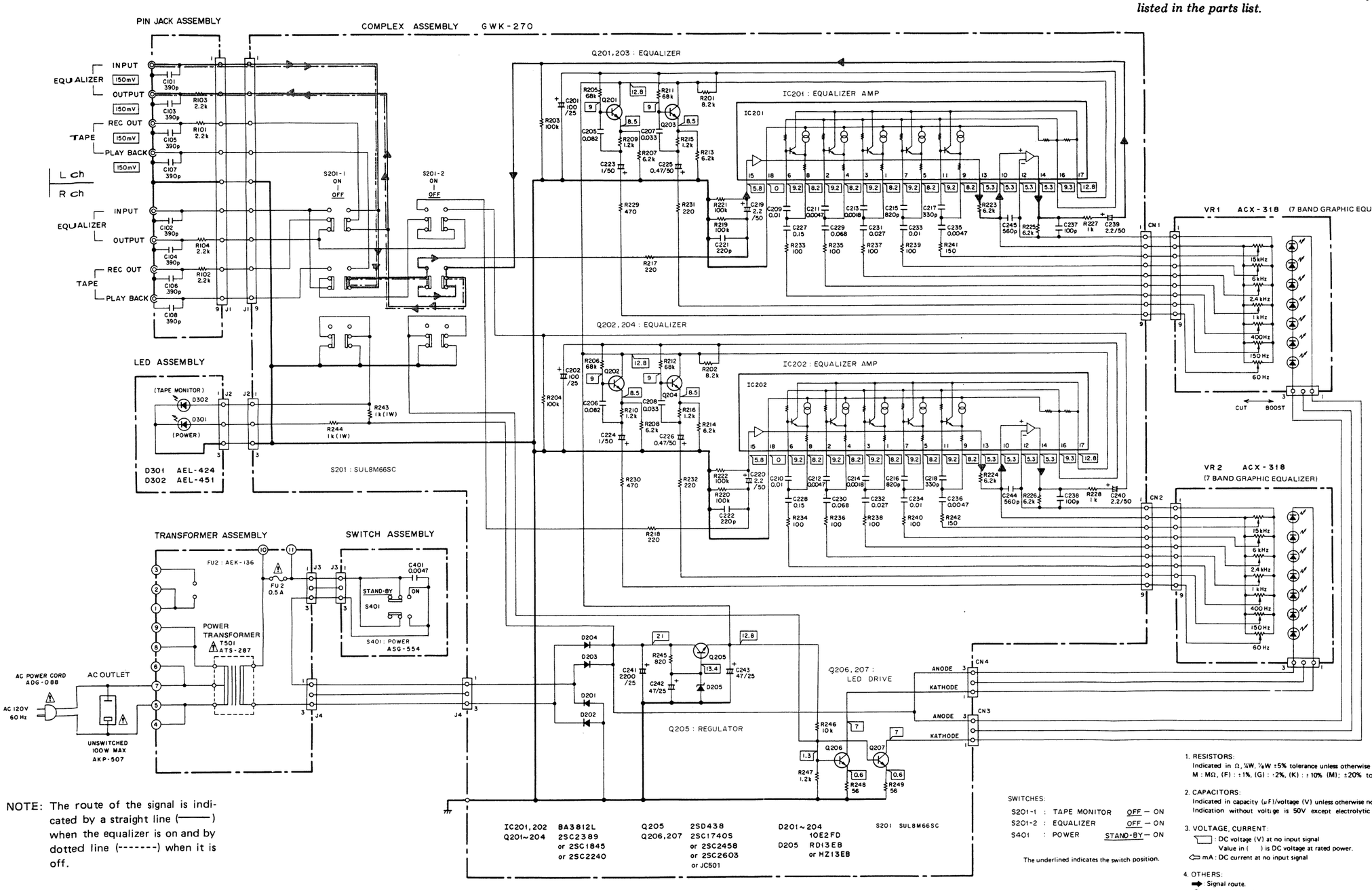


BA3812L



6. SCHEMATIC DIAGRAM (For KU Type)

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



NOTE: The route of the signal is indicated by a straight line (——) when the equalizer is on and by dotted line (-------) when it is off.

SWITCHES:

S201-1	:	TAPE MONITOR	OFF — ON
S201-2	:	EQUALIZER	OFF — ON
S401	:	POWER	STAND-BY — ON

The underlined indicates the switch position.

1. RESISTORS:
Indicated in Ω, ¼W, ⅛W ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltge is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
: DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
mA : DC current at no input signal

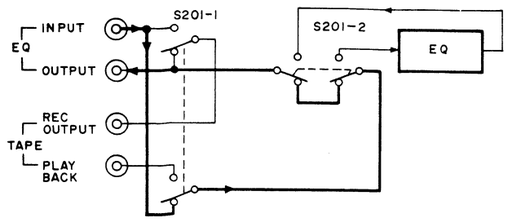
4. OTHERS:
Signal route.
: Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

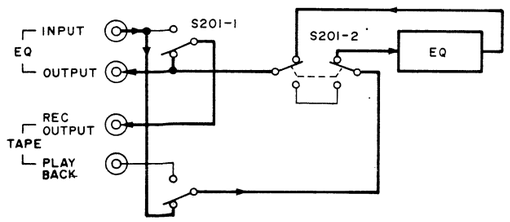
7. SIGNAL RUTE

SIGNAL RUTE

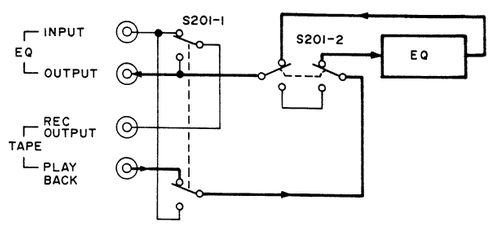
① TAPE MONITOR SW (S201-1): OFF
EQUALIZER SW (S201-2): OFF



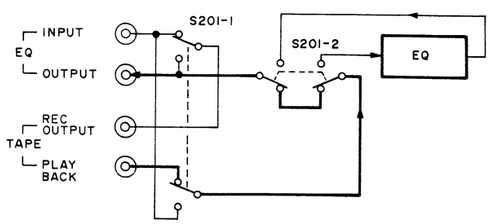
② TAPE MONITOR SW (S201-1): OFF
EQUALIZER SW (S201-2): ON



③ TAPE MONITOR SW (S201-1): ON
EQUALIZER SW (S201-2): ON



④ TAPE MONITOR SW (S201-1): ON
EQUALIZER SW (S201-2): OFF



8. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).*

560Ω	*56 × 10¹*	*561*	*RD¼PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD¼PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

  Ex. 2 *When there are 3 effective digits (such as in high precision metal film resistors).*

5.62kΩ	*562 × 10¹*	*5621*	*RN¼SR 5 6 2 1 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Miscellaneous Parts

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	Complex assembly	GWK-270
	Switch assembly	Non supply
	Transformer assembly	Non supply
	Pin jack assembly	Non supply
	LED Assembly	Non supply

OTHERS

Mark	Symbol & Description		Part No.
★		7 Band variable resistor	ACX-318
⚠		AC Socket (AC OUTLET)	AKP-507
⚠ ★★	FU2	Fuse (0.5A)	AEK-136
⚠		AC Power cord	ADG-088

Complex Assembly (GWK-270)

SEMICONDUCTORS

Mark	Symbol & Description		Part No.
★★	IC201, IC202	AUDIO IC	BA3812L
★★	Q206, Q207		2SC1740S
			(JC501)
			(2SC2458)
			(2SC2603)
★★	Q201–Q204		2SC2389
			(2SC1845)
			(2SC2240)
★★	Q205		2SD438
★	D205		RD13EB
			(HZ13EB)
★	D201–D204		10E2FD

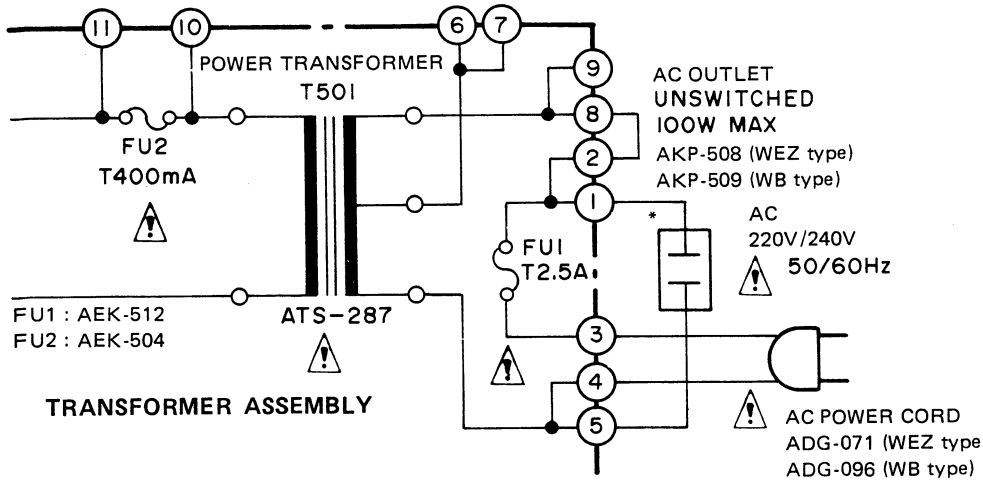
SWITCH

Mark	Symbol & Description	Part No.
★★	S201 Push switch (TAPE MONITOR, EQUALIZER)	SUL8M66SC

CAPACITORS

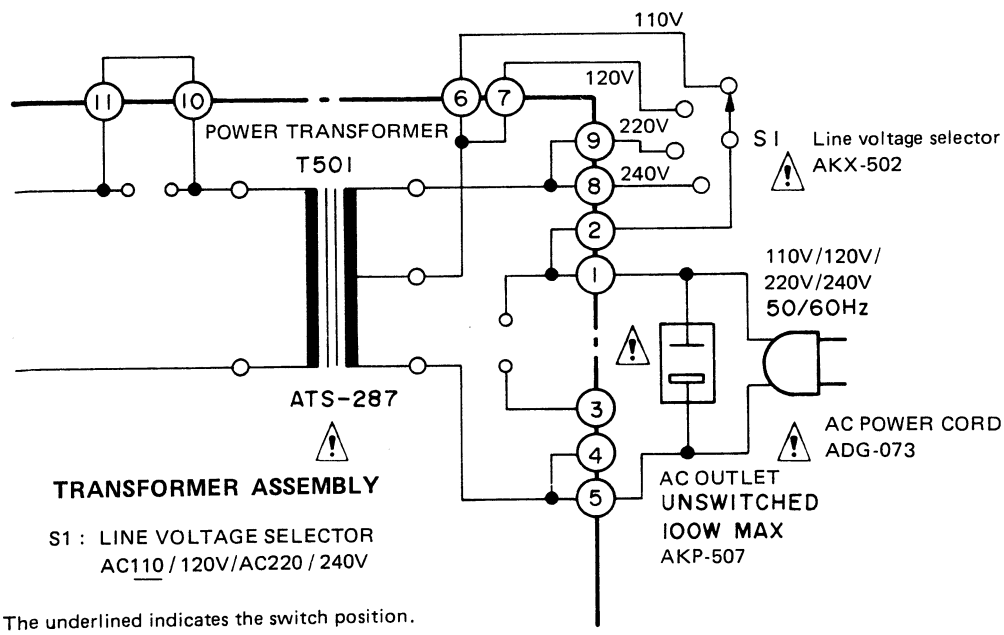
Mark	Symbol & Description	Part No.
	C237, C238	CCCSL101J50
	C221, C222	CCCSL221J50
	C225, C226	CEASR47M50
	C223, C224	CEAS010M50
	C201, C202	CEAS101M25
	C219, C220, C239, C240	CEAS2R2M50
	C241	CEAS222M25
	C242, C243	CEAS470M25
	C213, C214	CKCYB182K50
	C217, C218	CKCYB331K50
	C211, C212, C235, C236	CKCYB472K50
	C244, C245	CKCYB561K50
	C215, C216	CKCYB821K50
	C209, C210, C233, C234	CQMA103K50
	C227, C228	CQMA154K50
	C231, C232	CQMA273K50
	C207, C208	CQMA333K50
	C229, C230	CQMA683K50
	C205, C206	CQMA823K50

SCHEMATIC DIAGRAM FOR WEZ, WB AND WP TYPES



*The WP type is not equipped with an AC outlet.

SCHEMATIC DIAGRAM FOR S TYPE



The underlined indicates the switch position.

10. FOR S, WEZ, WB, AND WP TYPES

NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

The WEZ, WB, S and WP types are the same as the KU type with the exception of the following sections.

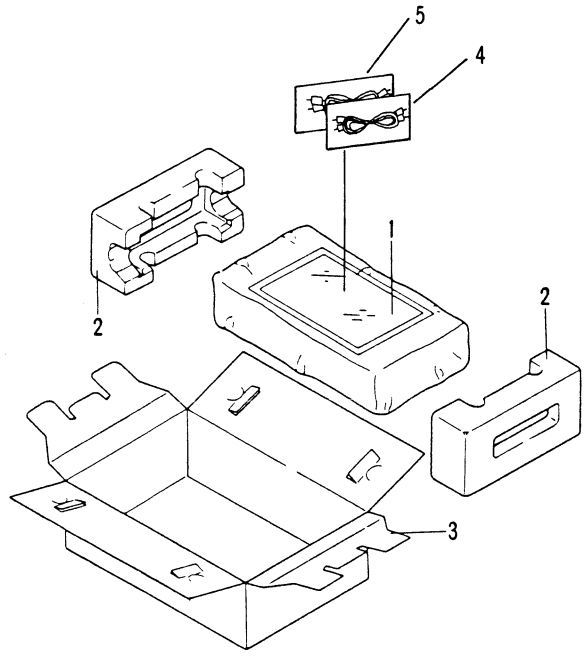
Contrast of Miscellaneous Parts

Mark	Symbol & Description		Part No.							Remarks
			GR-470 [BK]/ KU type	GR-470 [BK]/ WEZ type	GR-470 [BK]/ WB type	GR-470 [BK]/ S type	GR-470 [BK]/ WP type	GR-470/ WEZ type	GR-470/ WB type	
⚠		AC socket (AC OUTLET)	AKP-507	AKP-508	AKP-509	AKP-507	.....	AKP-508	AKP-509	
⚠ ★★	FU2	Fuse (0.5A)	AEK-136	.....	.....	.....	.....	.....	.....	
⚠ ★★	FU2	Fuse (T400mA)	.....	AEK-504	AEK-504	.....	AEK-504	AEK-504	AEK-504	
⚠ ★★	FU1	Fuse (T2.5A)	.....	AEK-512	AEK-512	.....	AEK-512	AEK-512	AEK-512	
⚠ ★★	S1	Line voltage selector (AC110V/120V/220V/240V)	.....	.....	.....	AKX-502	.....	.....	.....	
		Operating instructions (English)	ARB1012	.....	ARB1012	ARB1012	ARB1012	.....	ARB1012	
		Operating instructions (English/German/French/Italian)	.....	ARE1022	.....	.....	.....	ARE1022	.....	
		Operating instructions (Spanish)	.....	.....	.....	ARC1005	.....	.....	.....	
⚠		AC Power cord	ADG-088	ADG-071	ADG-096	ADG-073	ADG-064	ADG-071	ADG-096	
		Push knob (EQUALIZER TAPE, MONITOR)	AAY-398	AAY-398	AAY-398	AAY-398	AAY-398	AAD1026	AAD1026	
		Power knob (POWER)	AAY-405	AAY-405	AAY-405	AAY-405	AAY-405	AAD1037	AAD1037	
		Panel base	AMB1020	AMB1020	AMB1020	AMB1020	AMB1020	AMB1070	AMB1070	
		Front panel	ANB1009	ANB1009	ANB1009	ANB1009	ANB1009	ANB1013	ANB1013	
		Bonnet case	ANE1008	ANE1008	ANE1008	ANB1008	ANB1008	ANE1020	ANE1020	
		Packing case	AHD1037	AHD1037	AHD1037	AHD1037	AHD1037	AHD1038	AHD1038	

9. PACKING

PARTS LIST

Mark	No.	Part No.	Description
	1	ARB1012	Operating instructions (English)
	2	AHA-341	Side pad
	3	AHD1037	Packing case
	4	ADE-110	Connection cord
	5	ADE-111	Connection cord (Black color)



RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R245	RD1/4PM821J
	R243, R244	RS1PMF102J
	Other resistors	RD1/8PM□□□J

Switch Assembly

SWITCH

Mark	Symbol & Description		Part No.
★★	S401	Push switch (POWER)	ASG-554

CAPACITOR

Mark	Symbol & Description	Part No.
	C401	CQMA472K50

Transformer Assembly

TRANSFORMER

Mark	Symbol & Description		Part No.
⚠ ★	T501	Power transformer (120V)	ATS-287

Pin Jack Assembly

CAPACITORS

Mark	Symbol & Description	Part No.
	C101—C108	CKCYB391K50

RESISTORS

Mark	Symbol & Description	Part No.
	R101—R104	RD1/8PM222J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal 4P (EQUALIZER INPUT/ OUTPUT, TAPE)	AKB-094

LED Assembly

SEMICONDUCTORS

Mark	Symbol & Description		Part No.
★	D301	LED (POWER)	AEL-424
★	D302	LED (TAPE MONITOR)	AEL-451